

DOCUMENTATION PAGE

DRAFT COPY
MAY 1994 Revision

AD-A271 373

REPORT DATE
02/00/90

REQUEST TYPE AND DATES COVERED

1. FINAL DECISION DOCUMENT FOR THE INTERIM RESPONSE ACTION AT THE MOTOR POOL AREA ROCKY MOUNTAIN ARSENAL, VERSION 4.0

2. FUNDING NUMBER(S)

DAAA15 88 D 0022

3. AUTHOR(S)

4. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

WOODWARD-CLYDE CONSULTANTS

5. PERFORMING ORGANIZATION REPORT NUMBER

90072R04

6. SPONSORING MONITORING AGENCY NAME(S) AND ADDRESS(ES)

ROCKY MOUNTAIN ARSENAL (CO.). PMRMA

7. SPONSORING MONITORING AGENCY REPORT NUMBER

8. SUPPLEMENTARY NOTES

DTIC
SELECTED
OCT 21 1993
S B D

12a. DISTRIBUTION AVAILABILITY STATEMENT

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED

12b. DISTRIBUTION CODE

13. ABSTRACT (Maximum 200 words)

THE OBJECTIVE OF THE INTERIM RESPONSE ACTION AT THE MOTOR POOL AREA IS TO MITIGATE THE THREAT OF RELEASES OF TRCLE. THE PROPOSED IRA WILL CONSIST OF THE INSTALLATION OF A VAPOR EXTRACTION SYSTEM TO REMOVE AND TREAT THE SOIL CONTAMINATION AT AN IDENTIFIED SOURCE OF TRCLE AT THE MOTOR POOL. A GROUND WATER EXTRACTION AND TREATMENT SYSTEM WILL BE INSTALLED TO CONTAIN THE TRCLE PLUME EMANATING FROM THE AREA.

THIS DECISION DOCUMENT PROVIDES SUMMARIES OF:

1. ALTERNATIVE TECHNOLOGIES CONSIDERED
2. SIGNIFICANT EVENTS LEADING TO THE INITIATION OF THE IRA
3. THE IRA PROJECT
4. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS, STANDARDS, CRITERIA, AND LIMITATIONS (ARAR'S) ASSOCIATED WITH THE PROGRAM.

14. SUBJECT TERMS
IRA L, REGULATION, ARAR, VAPOR EXTRACTION

15. NUMBER OF PAGES

16. PRICE CODE

17. SECURITY CLASSIFICATION
UNCLASSIFIED18. SECURITY CLASSIFICATION
OF THIS PAGE19. SECURITY CLASSIFICATION
OF ABSTRACT

20. LIMITATION OF ABSTRACT

FINAL DECISION DOCUMENT
FOR THE INTERIM RESPONSE ACTION
AT THE
MOTOR POOL AREA
ROCKY MOUNTAIN ARSENAL
FEBRUARY 1990
CONTRACT NO. DAAA15-88-D-0022/0002
VERSION 4.0

Prepared by:

WOODWARD-CLYDE CONSULTANTS

Prepared for:

PROGRAM MANAGER FOR ROCKY MOUNTAIN ARSENAL

93-25176

93 10 19 197

THE INFORMATION AND CONCLUSIONS PRESENTED IN THIS REPORT REPRESENT THE OFFICIAL POSITION OF THE DEPARTMENT OF THE ARMY UNLESS EXPRESSLY MODIFIED BY A SUBSEQUENT DOCUMENT. THIS REPORT CONSTITUTES THE RELEVANT PORTION OF THE ADMINISTRATIVE RECORD FOR THIS CERCLA OPERABLE UNIT.

THE USE OF TRADE NAMES IN THIS REPORT DOES NOT CONSTITUTE AN OFFICIAL ENDORSEMENT OR APPROVAL OF THE USE OF SUCH COMMERCIAL PRODUCTS. THIS REPORT MAY NOT BE CITED FOR PURPOSES OF ADVERTISEMENT

Rocky Mountain Arsenal
Information Center
Commerce City, Colorado

TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION	1-1
2.0 HISTORY OF THE MOTOR POOL AREA	2-1
3.0 INTERIM RESPONSE ACTION OBJECTIVE	3-1
4.0 INTERIM RESPONSE ACTION ALTERNATIVES	4-1
4.1 NO ACTION	4-1
4.2 MONITORING	4-2
4.3 INSTITUTIONAL CONTROLS	4-2
4.4 MULTILAYERED CAP	4-2
4.5 IN SITU VAPOR EXTRACTION	4-3
4.6 ONSITE INCINERATION	4-4
4.7 BIOREMEDIALION	4-4
4.8 LOW-TEMPERATURE THERMAL DESORPTION	4-5
4.9 OFFSITE INCINERATION	4-5
4.10 CONCLUSIONS	4-6
5.0 CHRONOLOGY OF EVENTS	5-1
6.0 SUMMARY OF THE INTERIM RESPONSE ACTION	6-1
6.1 HEALTH & SAFETY PLAN	6-2
7.0 INTERIM RESPONSE ACTION PROCESS	7-1
8.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE REMEDIATION OF OTHER CONTAMINATION SOURCES-MOTOR POOL AREA INTERIM RESPONSE ACTION	8-1
8.1 INTRODUCTION	8-1
8.2 AMBIENT OR CHEMICAL-SPECIFIC ARARs	8-1
8.2.1 Air Emissions	8-2
8.3 LOCATION-SPECIFIC ARARs	8-3
8.4 ACTION-SPECIFIC ARARs	8-4
8.4.1 Description	8-4
8.4.2 Construction of Treatment System	8-4
8.5 COMPLIANCE WITH THE OTHER ENVIRONMENTAL LAWS	8-9
9.0 SCHEDULE	9-1
10.0 CONSISTENCY WITH THE FINAL REMEDIAL ACTION	10-1
11.0 REFERENCES	11-1
APPENDIX A COMMENTS AND RESPONSES	

Woodward-Clyde Consultants

FIGURES

	<u>Page</u>
1-1 Decision Flow Chart for Other Contamination Sources IRAs	1-2
2-1 Location Map - Rocky Mountain Arsenal	2-2
2-2 Motor Pool Area Vicinity Map	2-3
2-3 TCE Soil Gas Plume 1989 Final Investigation Motor Pool Area	2-5
2-4 TCE Groundwater Plume	2-6

Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By _____	
Distribution/ _____	
Availability Codes	
Dist	Avail and/or
	Special
R-1	

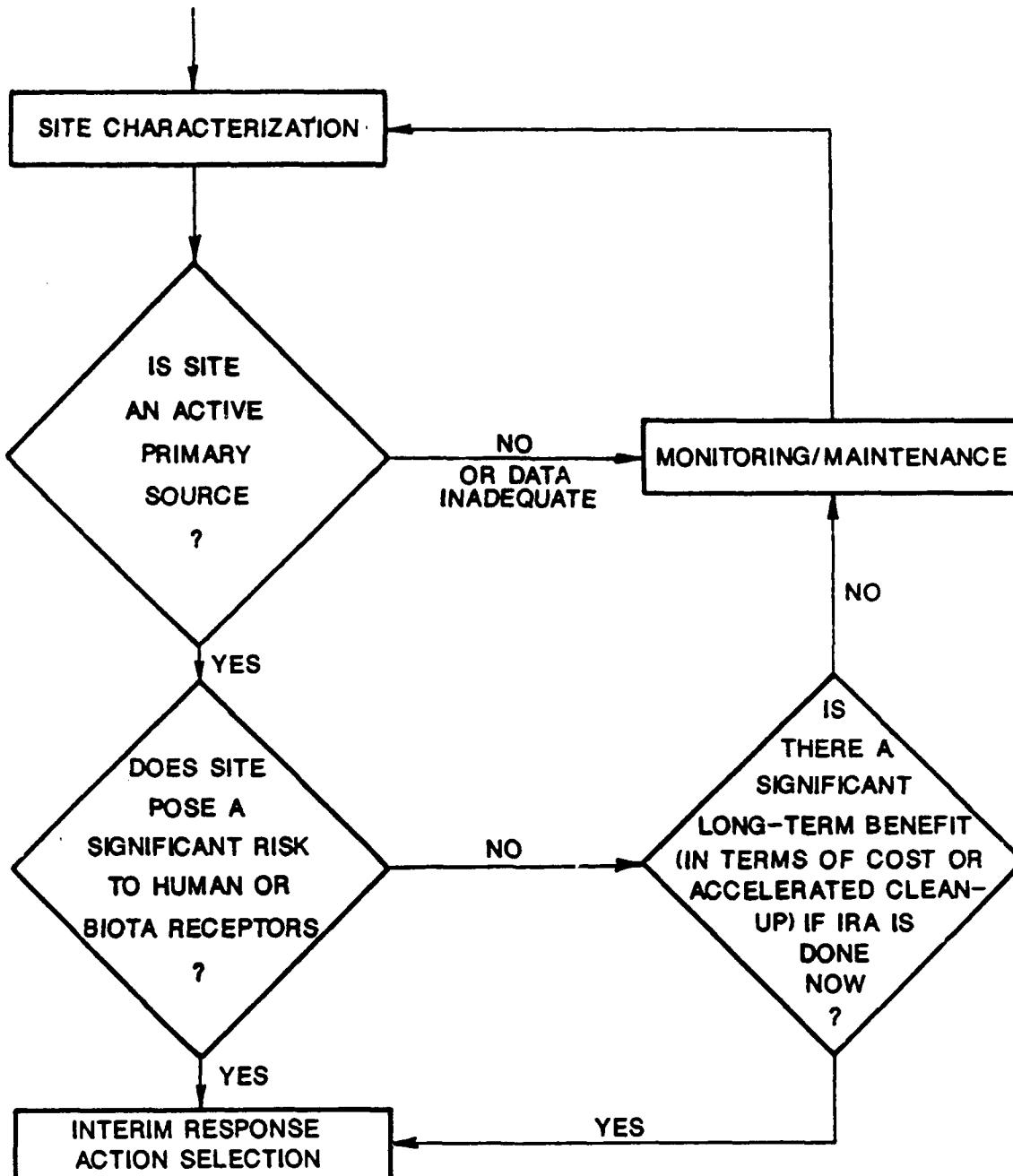
**1.0
INTRODUCTION**

The Interim Response Action (IRA) alternatives assessment and decision process for the Motor Pool Area at the Rocky Mountain Arsenal (RMA) is being conducted as part of the IRA process for RMA in accordance with the Federal Facility Agreement and the Technical Program Plan.

Determinations concerning the implementation of this IRA have been reached through a consideration of the objectives of Sections 2.3(a), 22.5, and 22.6 of the Federal Facility Agreement and by application of the Decision Flow Chart for Other Contamination Sources IRAs adopted by the Organizations and the State in the June 7, 1989 Subcommittee meeting (Figure 1-1).

Alternatives have been reviewed based on their overall protectiveness of human health and the environment; compliance to the maximum extent practicable with Applicable or Relevant and Appropriate Requirements (ARARs); reduction in mobility, toxicity, or volume; short- and long-term effectiveness; implementability; and cost-effectiveness. The IRA Alternatives Assessment for the Motor Pool Area concludes that there appears to be both a long-term cost and technical benefit in performing an IRA now since treatment after the trichloroethylene (TCE) has spread becomes both more complex and costly insofar as a larger area must be addressed.

The proposed IRA will consist of the installation of a vapor extraction system at an identified source of trichloroethylene in the Motor Pool Area, to remove and treat the soil contamination. A groundwater extraction and treatment system will be installed to contain the TCE plume emanating from the Motor Pool Area. Treatment of the extracted groundwater may be performed at the Irondale Boundary Control System or at a separate treatment system. This separate system may be implemented and operated either independently or in conjunction with the Rail Classification Yard IRA.



Job No. : 22238-4400
Prepared by : K.A.S.
Date : 12/18/89

DECISION FLOW CHART FOR OTHER
CONTAMINATION SOURCES IRAs

Figure 1-1

HISTORY OF THE MOTOR POOL AREA

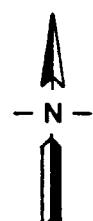
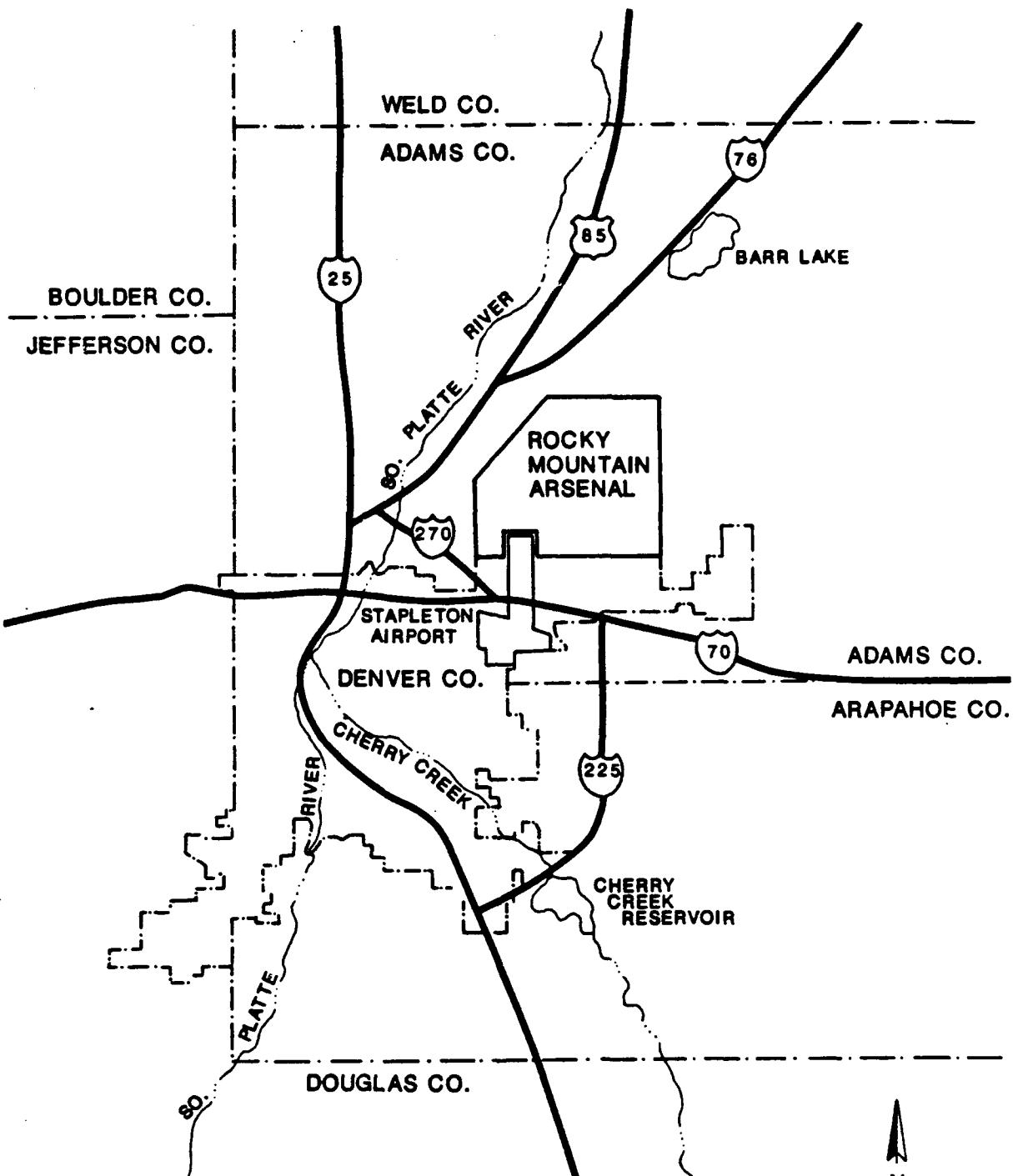
Rocky Mountain Arsenal (RMA) occupies more than 17,000 acres (approximately 27 square miles) in Adams County, directly northeast of metropolitan Denver, Colorado (Figure 2-1). The property was purchased by the U.S. government in 1942 for use in World War II to manufacture and assemble chemical warfare materials, such as mustard and lewisite, and incendiary munitions. Starting in the 1950s, RMA produced the nerve agent GB (isopropyl methylphosphonofluoride) until late 1969. A significant amount of chemical warfare materials destruction took place during the 1950s and 1960s. Since 1970, RMA has primarily been involved with the destruction of chemical warfare materials. The last military operations at RMA ended in the early 1980s. In November 1988, the RMA was reduced to inactive military status reflecting the fact that the only remaining mission at the Arsenal is contamination cleanup. In addition to these military activities, major portions of the plant facilities were leased to private industries, including Shell Oil Company, for the manufacture of various insecticides and herbicides between 1947 and 1982.

The Motor Pool Area is located in the southeastern corner of Section 4 on the RMA. The site was acquired by the U.S. Army in 1942 as part of RMA, and it has been used since the 1940s for servicing equipment, vehicles, and railroad cars, as well as for storing fuel, road oil, and flammable liquids. Figure 2-2 shows the Motor Pool Area.

An aboveground storage tank farm in the northern part of the Motor Pool Area has been used since the early 1940s for storage of diesel fuel, gasoline, road oil, and drain oil. There is a record of a break in an underground line connecting these tanks to the service station to the east, creating a diesel fuel spill. Other spills related to piping from underground tanks and tanker truck leaks have also occurred in the service station area (Ebasco 1989).

In the early 1950s, several buildings in the northern part of the Motor Pool Area were used for pesticide and herbicide storage. During this same period, Julius Hyman and Company operated laboratories for the study of insecticides and plant pathology near the southern part of the Motor Pool Area. Shell Oil Company took over these facilities in 1953 and maintained an agricultural research and bioassay laboratory there until 1957 (Ebasco 1989).

The site was surveyed in 1986 for recent trichloroethylene (TCE) use because TCE had been found in groundwater monitoring wells near the Motor Pool Area and in downgradient Adams County water supply wells in 1985; however, no TCE use was found during the 1986 survey. Records indicated, however, that solvents probably were used for cleaning and repairing equipment and vehicles in buildings surrounding the Motor Pool

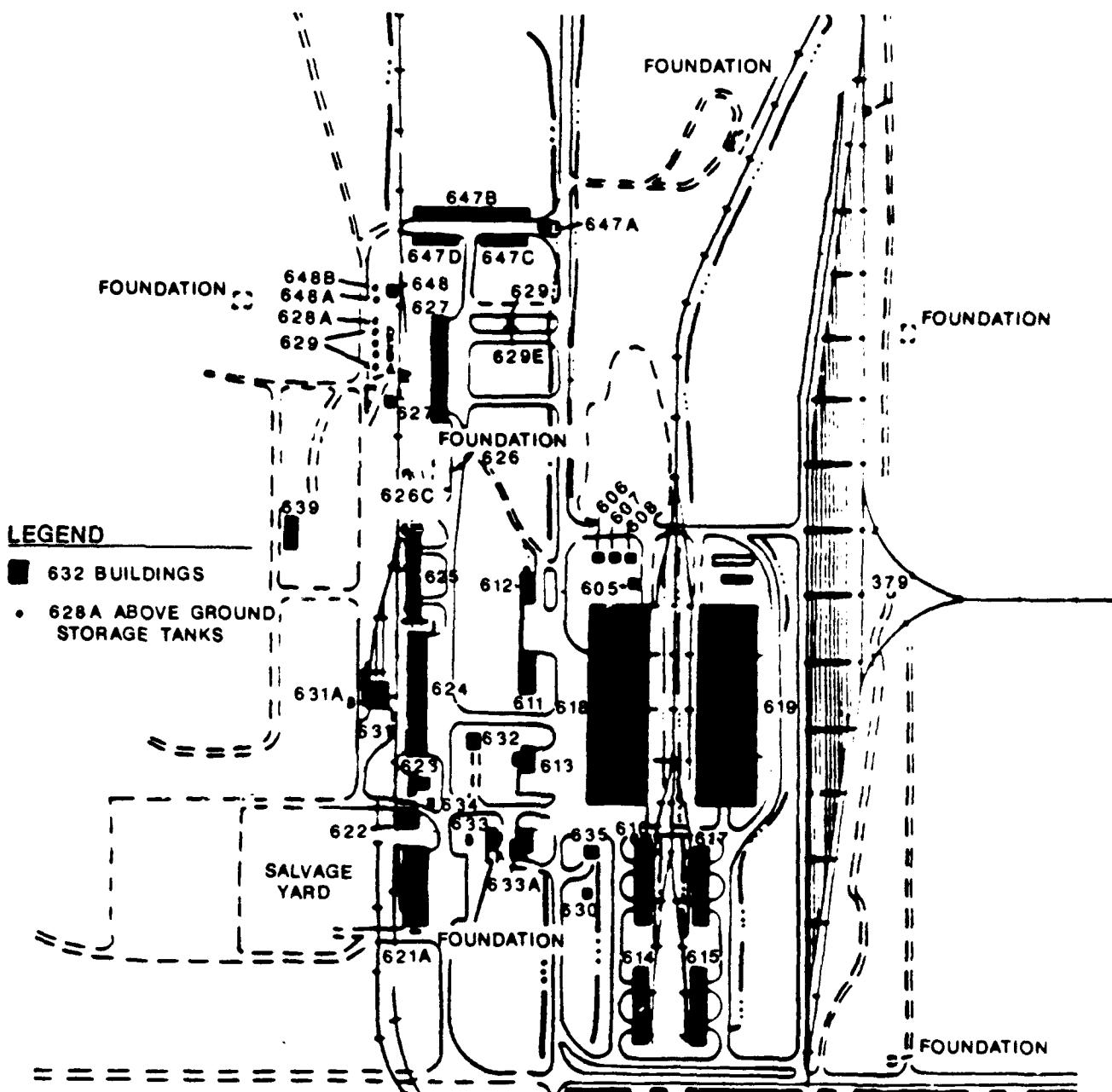


0 1 2 3 4 5
SCALE IN MILES

Job No. : 22238-4400
Prepared by : K.A.S.
Date : 12/18/89

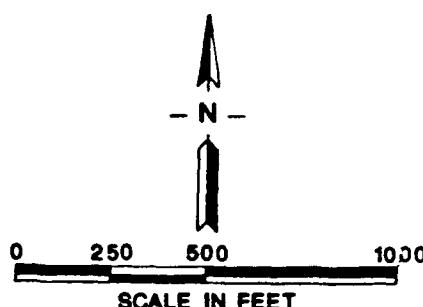
LOCATION MAP RMA

Figure 2-1



RMA				
	23	24	19	20
27	26	25	30	29
33	34	35	36	31
4	3	2	1	6
9		11	12	7
				8

KEY MAP



SOURCE: EBASCO, MOTOR POOL
AREA CONTAMINATION
ASSESSMENT REPORT,
1988

Job No. : 22238-4400
Prepared by : K.A.S.
Date : 12/18/89

MOTOR POOL AREA VICINITY MAP

Figure 2-2

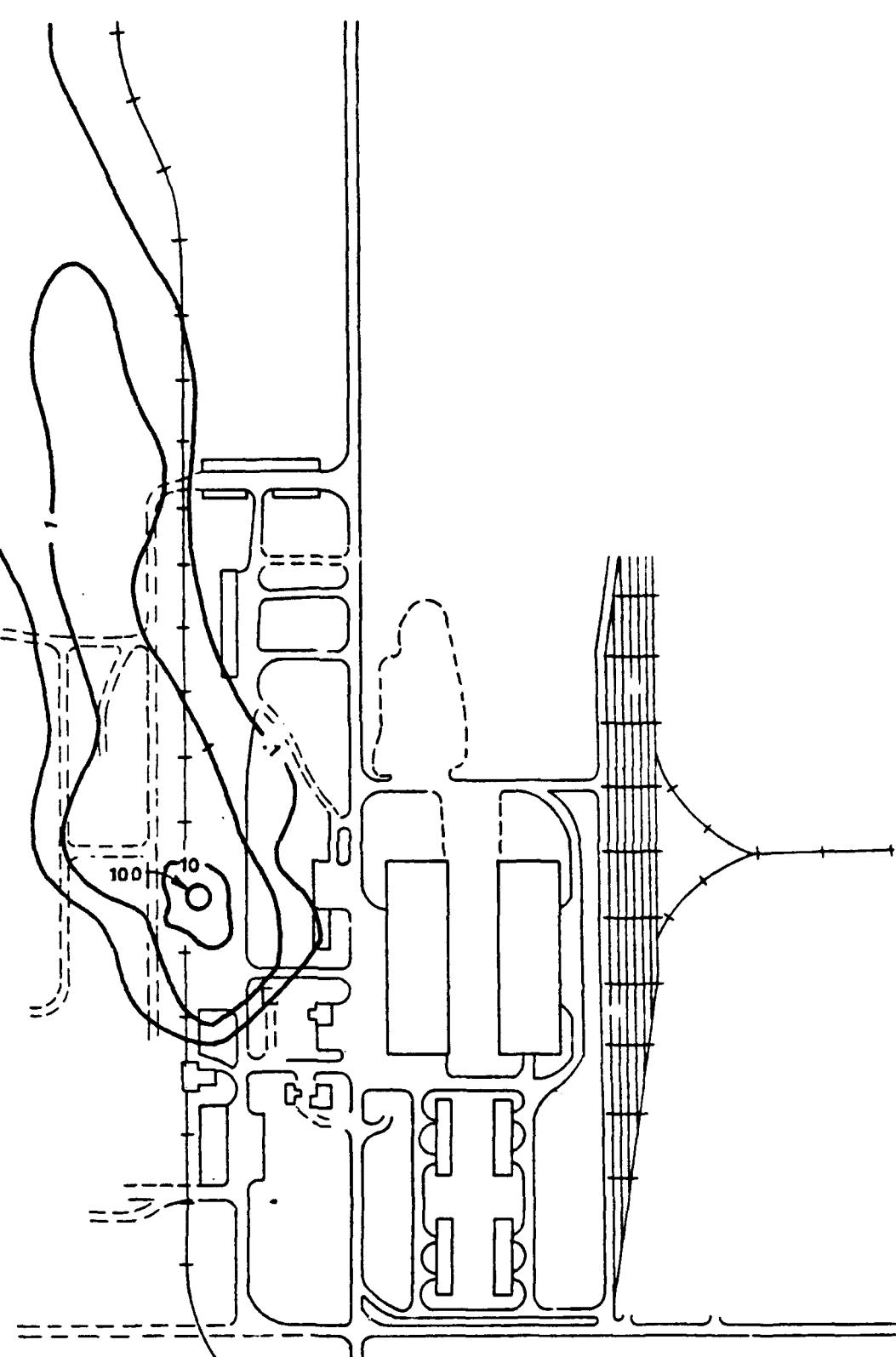
Area from the early 1940s until at least 1985. Caustics, rust inhibitors, fuel, oil, and grease were also used, and metal surfaces of the equipment and vehicles were stripped and sanded there. Some of the buildings were known to discharge water and other liquids and residues from these maintenance operations through floor drains and pipes into unlined ditches. The Motor Pool Area is still in use for motor vehicle and railcar maintenance (Ebasco 1989).

Two soil gas surveys were conducted in the Motor Pool Area in 1986 to aid in defining any plumes of TCE contamination in the groundwater. The studies defined an apparent TCE soil gas concentration in the area north of the roundhouse (Building 631) and a soil gas plume extending to the northwest (Ebasco 1988). However, no specific source was identified.

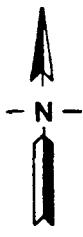
Another soil gas survey conducted in July 1989 traced the TCE source to an area adjacent to Building 624 where a pipe from a floor drain was found to discharge into an unlined ditch (WCC 1989). Historical records have been found that indicate that TURCO® (a TCE-based solvent) was used to clean equipment in Building 624. Figure 2-3 shows the soil gas plume that was used to define the source area. Concentrations of TCE in the soil gas samples ranged from less than 0.01 ug/l soil gas at the edges of the plume to greater than 600 ug/l soil gas at the source. For evaluation purposes, the extent of contamination has been considered to be a 60 foot by 100 foot source area bound on the north and south by Buildings 624 and 625, respectively; on the east by the walkway between Buildings 624 and 625; and on the west by the rail spur. It was estimated that approximately 4,500 cubic yards of soil would be addressed by this IRA, for the purposes of the alternatives assessment. The soil gas plume extends approximately 2,500 feet north of the source area.

In addition to the apparent TCE soil contamination, a TCE groundwater plume has been identified emanating from the Motor Pool Area (Figure 2-4).

On February 1, 1988, a proposed Consent Decree was lodged in the case of United States vs. Shell Oil Company with the U.S. District Court in Denver, Colorado. The proposed Consent Decree was revised after public comments were received, and a modified proposed Consent Decree was lodged with the Court on June 7, 1988. In February 1989, a Federal Facility Agreement was entered into between five federal agencies: the Environmental Protection Agency, the Army, the Department of the Interior, the Department of Health and Human Services, and the Department of Justice, which established procedures for implementing the Arsenal cleanup program as specified in the Technical Program Plan and incorporates many provisions of the modified proposed Consent Decree. The Army and Shell Oil Company agreed to share certain costs of the remediation to be developed and performed under the oversight of the U.S. Environmental Protection Agency, with opportunities for participation by the State of Colorado. The long-term remediation is a complex task that will take several years to complete. The Federal Facility Agreement specifies 13 Interim Response Actions (IRAs) determined to be necessary and appropriate. The "Remediation of Other Contamination Sources" is one of the

LEGEND

TCE in ug/l soil gas

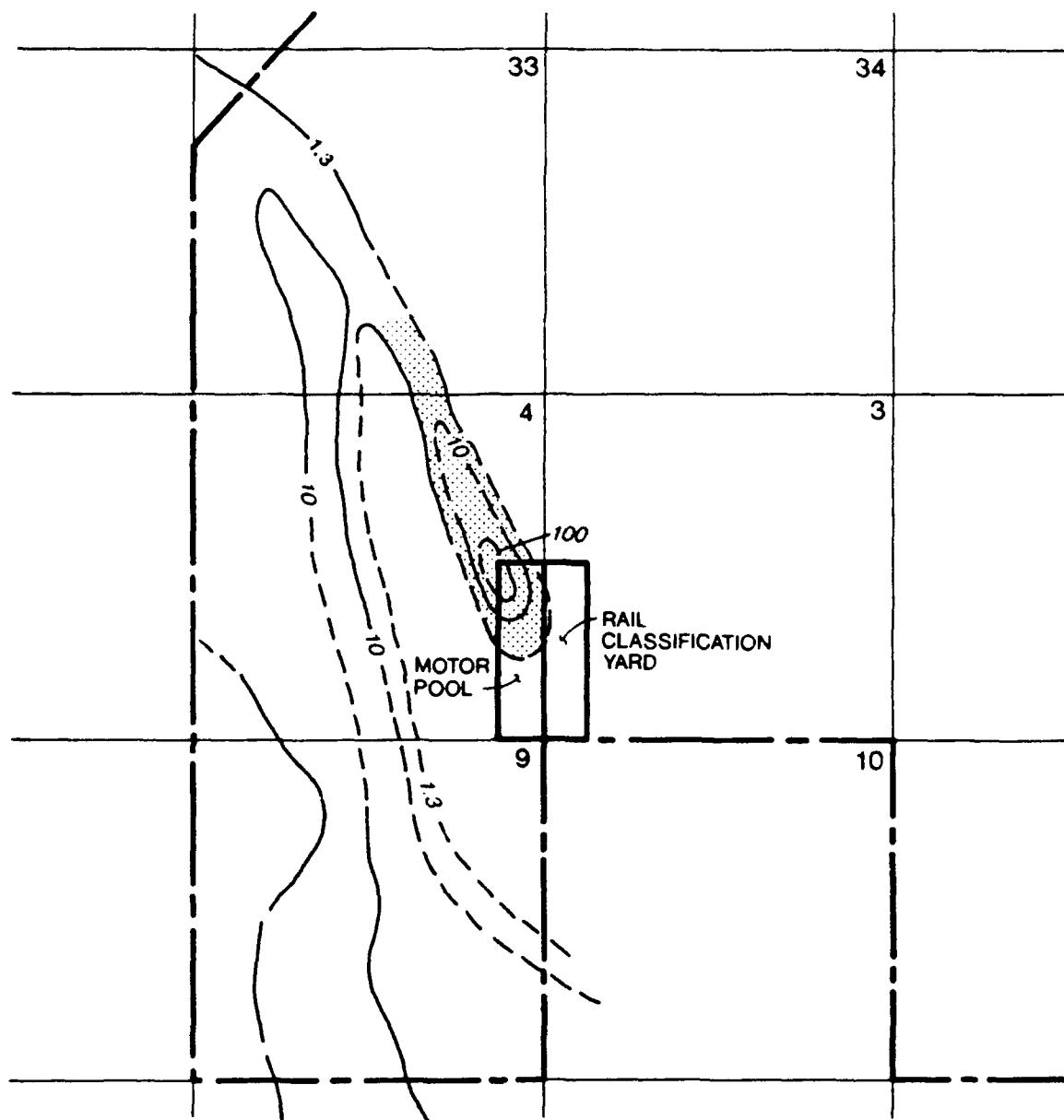


0 250 500 1000
SCALE IN FEET

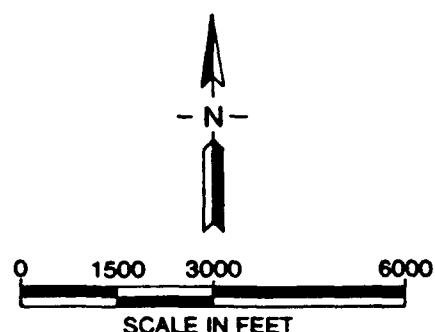
Job No. : 22238-4400
Prepared by : H.W.M./K.A.S.
Date : 12/18/89

TCE SOIL GAS PLUME 1989 FIELD
INVESTIGATION MOTOR POOL AREA

Figure 2-3

LEGEND

- Isoconcentration Line. Dashed where Inferred
- TCE Plume Emanating from the Motor Pool Area
- RMA Boundary
- 1.3 Isoconcentration Values ($\mu\text{g/l}$)
- 10
- 100
- 1000
- 2000



SOURCE: Figure 4.3-19 Trichloroethene (TRCLE) Plumes/Unconfined Groundwater Flow System/Winter 1987/88 CMP Groundwater Monitoring Annual Report/Prepared by: R.L. Stollar & Associates Inc. Harding Lawson Associates

Job No. : 2002-440-39	TCE GROUNDWATER PLUME
Prepared by : K.A.S.	
Date : 01/30/90	

Figure 2-4

Woodward-Clyde Consultants

13 IRAs. The Motor Pool Area is one of several sites being addressed by the remediation of other contamination sources IRA. The action at this site consists of assessment and, as necessary, the selection and implementation of an interim action.

INTERIM RESPONSE ACTION OBJECTIVE

The objective of the Interim Response Action (IRA) Alternatives Assessment for the Motor Pool Area is to assess whether immediate action at this site is appropriate and to recommend, if necessary, an IRA alternative to mitigate the threat of releases of volatile organic contaminants from the Motor Pool Area on an interim basis, pending determination of the final remedy in the Onpost Record of Decision (ROD).

The IRA alternatives have been evaluated based on the following criteria:

- Overall protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) to the maximum extent practicable
- Reduction of mobility, toxicity, or volume
- Short- and long-term effectiveness
- Implementability
- Cost

This Decision Document provides a summary of the alternative technologies considered, a chronology of the significant events leading to the initiation of the IRA, a summary of the IRA project, and a summary of the ARARs (legal and regulatory standards, criteria, or limitations) associated with the program.

As specified in the Federal Facility Agreement, this IRA will, by treatment of soils and containment of groundwater, to the maximum extent practicable, be consistent with and contribute to the efficient performance of the Final Response Action.

This section describes the interim response action (IRA) alternatives developed in the IRA Alternatives Assessment for the Motor Pool Area (WCC 1989) and discusses the evaluation of these alternatives. The following alternatives were evaluated:

- No Action
- Monitoring
- Institutional Controls
- Multilayered Cap*
- In Situ Vapor Extraction*
- Onsite Incineration*
- Bioremediation*
- Low-temperature Thermal Desorption*
- Offsite Incineration*

*These alternatives include groundwater interception and treatment.

All of these alternatives were subject to an evaluation in the IRA Alternatives Assessment. The IRA Alternatives Assessment for the Motor Pool Area concludes that there appears to be both a long-term cost and technical benefit in performing an IRA now since treatment after the trichloroethylene (TCE) has spread becomes both more complex and costly insofar as a larger area must be addressed.

Following is a description and a brief summary of the evaluation of each alternative. Alternatives that reduce contaminant mobility, toxicity, or volume are preferred. One of the evaluation criteria that showed the greatest variability between alternatives was the ability of the alternative to reduce contaminant mobility, toxicity, or volume. All of the alternatives can be designed and implemented to meet Applicable or Relevant and Appropriate Requirements (ARARs) to the maximum extent practicable. Details of the evaluation can be found in the IRA Alternatives Assessment for this site (WCC 1989a).

4.1 NO ACTION

This alternative consists of taking no action to contain or treat contaminated soils at the Motor Pool Area. The no action alternative is not protective of human health and the environment. This alternative would not reduce contaminant mobility, toxicity, or volume, and has no short-term impacts. However, it also has no long-term effectiveness. It can be easily implemented at no cost.

4.2 MONITORING

This alternative consists of conducting upgradient and downgradient groundwater sampling.

Monitoring would allow continued tracking of contaminant movement, thereby providing additional information on protection of human health and the environment. However, this alternative would not reduce contaminant mobility, toxicity, or volume. This alternative has good short-term effectiveness with respect to its impact on the community and workers. The long-term effectiveness of this alternative relies on the effectiveness of the current downgradient extraction and treatment systems to protect drinking water supplies. Monitoring can be easily implemented at low cost.

4.3 INSTITUTIONAL CONTROLS

This alternative consists of constructing a chain-link fence with controlled access points around the area of concern. In addition, a groundwater monitoring program would be conducted.

The monitoring aspect of this alternative would allow continued tracking of contaminant movement, thereby providing additional information on protection of human health and the environment. However, this alternative would not reduce contaminant mobility, toxicity, or volume. Since RMA already has limited access maintained by physical barriers and security personnel, additional site restrictions would be of limited effectiveness. This alternative would have minimal short-term impacts on the community and workers; however, it would be of limited effectiveness in the long-term. Institutional controls can be easily implemented at low cost.

4.4 MULTILAYERED CAP

This alternative consists of constructing a multilayered cap over the contaminated soils in the Motor Pool Area. For evaluation purposes only, the cap would consist of, from the base upward, an 18-inch-thick layer of low permeability clay, a flexible membrane liner, a synthetic drainage net, a geotextile filter fabric, and a 1-foot protective soil layer. The cap would be sloped from the center to facilitate runoff. The cap would reduce infiltration of precipitation and surface water. In addition, a groundwater monitoring program would be conducted as part of this alternative.

A groundwater interception and treatment system would also be implemented as part of this alternative to contain the TCE groundwater plume emanating from the Motor Pool Area (Figure 2-4). Groundwater extraction wells would be located north-northwest of the Motor Pool Area. The limits of containment would be set during design. Extracted water would be sent through conveyance piping for subsequent treatment. This treatment would be performed either at the Irondale Boundary Control System, which may be expanded to deal with the

increased flow, or to a separate treatment system. The separate treatment system could be designed either to address groundwater extracted from the Motor Pool TCE plume, or both the Motor Pool TCE plume and the Rail Classification Yard IRA plume. Shell Oil Company is currently progressing on an effort to better define these plumes and will evaluate the effectiveness of integrating the two containment systems.

This alternative is somewhat protective of human health and the environment. The cap would reduce vertical mobility of contaminants, although it does not reduce contaminant toxicity or volume. The groundwater extraction and treatment system would reduce both the toxicity and mobility of the TCE contamination. This alternative has good short-term effectiveness with respect to its impact on the community and workers. This alternative can be easily implemented because it is based on demonstrated technology that has been widely used. The long-term effectiveness of this alternative is somewhat limited because it is a containment technology that does not actually remove or treat the source of contamination. Periodic reevaluation would be necessary to assess the continued effectiveness of this containment system. It can be readily implemented at a relatively low cost.

4.5 IN SITU VAPOR EXTRACTION

This alternative consists of installing an in situ vapor extraction system to treat the contaminated soils in the unsaturated (vadose) zone of the Motor Pool Area. The vapor extraction process consists of applying a vacuum to a well or trench screened in the zone of contamination, inducing a flow of air through adjacent soils, and progressively air-stripping the volatile contaminants contained in the soil matrix. The contaminants are then adsorbed onto activated carbon and destroyed when the carbon is thermally reactivated off site. In addition, a groundwater monitoring program would be conducted. A groundwater interception and treatment system would also be implemented as part of this alternative, as described in subsection 4.4.

This alternative is protective of human health and the environment. The vapor extraction system reduces contaminant mobility, toxicity, and volume because contaminants are removed from the soil and destroyed during the thermal reactivation of the carbon. The groundwater extraction and treatment system would reduce both the toxicity and mobility of the TCE contamination. A vapor extraction system can be designed and implemented to produce minimal short-term impacts on the community and workers. This alternative can be easily implemented at a relatively low cost because it is based on demonstrated technology that has been widely used. The vapor extraction system can be easily adapted to a greater depth or extent of contamination, which is important because of the uncertainties in contaminated soil volume at this site.

4.6 ONSITE INCINERATION

The onsite incineration alternative consists of excavating the contaminated soils in the Motor Pool Area, incinerating the soils in a mobile rotary kiln incinerator, and placing the treated soil back into the excavation. In addition, a groundwater monitoring program would be conducted. A groundwater interception and treatment system would also be implemented as part of this alternative, as described in subsection 4.4.

Although this alternative has good long-term effectiveness because it destroys the contaminants, onsite incineration is more difficult to implement than other alternatives because of the more complex mechanical operation, monitoring, and control to maintain high destruction and removal efficiencies. The groundwater extraction and treatment system would reduce both the toxicity and mobility of the TCE contamination. There are possible short-term impacts on the community and workers related to air emissions from the incinerator. However, these short-term impacts can be mitigated through the proper design of air pollution control equipment. This IRA alternative is very costly relative to other treatment alternatives.

4.7 BIOREMEDIATION

This alternative consists of excavating the contaminated soils in the Motor Pool Area and treating them with bioremediation. Excavated soil would be fed by conveyor to an agitation vessel where the soil would be mixed with water and a concentrated slurry of microorganisms. The slurry would then be transferred to a series of liquid/solid contact bioreactors where sufficient air and nutrients are introduced to maintain the biodegradation of the organic contaminants in the soil. In addition, a groundwater monitoring program would be conducted. A groundwater interception and treatment system would also be implemented as part of this alternative, as described in subsection 4.4.

This alternative is protective of human health and the environment. The contaminant mobility, toxicity, and volume are reduced and the long-term effectiveness of this alternative is good because the organic contaminants are destroyed. This alternative can be designed to minimize short-term impacts on the community and workers. However, there are some uncertainties in bioreactor rates and retention times that could affect the schedule. Also, there is some potential for the generation of partial degradation products such as dichloroethene and vinyl chloride. Because of the uncertainties in the depth of contaminated soil, modified excavation techniques may be required, which could make the alternative more difficult to implement and increase the costs.

4.8 LOW-TEMPERATURE THERMAL DESORPTION

This alternative consists of excavating the contaminated soils in the Motor Pool Area and treating them with low-temperature thermal desorption. Excavated and screened soil would be sent to a low-temperature thermal stripping processor or a rotary drum system that heats the solids to about 400° F and vaporizes the contaminants. Particulates would be removed from the contaminated vapor. The vapors would then be treated, probably either by condensation or through the use of an afterburner. If the vapors were condensed, the condensate would be sent to a solvent/water separator. The solvent phase would be recovered. The liquid phase would be sent through granular activated carbon prior to either reuse for dust control or disposal. Any noncondensibles would be routed through either a vapor phase carbon adsorber to remove any noncondensed organics or an afterburner. The spent carbon (both liquid and vapor phase) would be sent off site for thermal regeneration. If an afterburner would be used, all gases would be sent to this unit for thermal destruction. The afterburner would then exhaust to the atmosphere. In addition, a groundwater monitoring program would be conducted. A groundwater interception and treatment system would also be implemented as part of this alternative, as described in subsection 4.4.

This alternative is protective of human health and the environment. The contaminant mobility, toxicity, and volume are reduced, and the long-term effectiveness of this alternative is good because the organic contaminants are destroyed. This alternative can be designed to minimize short-term impacts on the community and workers. Because of the uncertainties in the depth of contamination, modified excavation techniques may be required, which could make the alternative more difficult to implement and increase the costs.

4.9 OFFSITE INCINERATION

This alternative consists of excavating contaminated soil in the Motor Pool Area and transporting the soils off site to an existing permitted hazardous waste incinerator. In addition, a groundwater monitoring program would be conducted. A groundwater interception and treatment system would also be implemented as part of this alternative, as described in subsection 4.4.

This alternative is protective of human health and the environment. The contaminant mobility, toxicity, and volume are reduced, and the long-term effectiveness of this alternative is good because the organic contaminants are destroyed. This alternative can be designed to minimize short-term impacts on the community and workers, although there may be some transportation risks. Because of the uncertainties in the depth of contamination, modified excavation techniques may be required, which could adversely affect implementability and cost. This alternative is very costly relative to other treatment alternatives.

4.10 CONCLUSIONS

Installing and operating an in situ vapor extraction system is the chosen alternative. This alternative can be easily implemented because it is based on demonstrated technology that has been widely used. The system can be easily adapted to a greater extent of contamination, which is important because of the uncertainties in contaminated soil volume at this site. Also, since the carbon is thermally reactivated, the contaminants are destroyed.

A groundwater interception, treatment, and injection system will also be implemented as part of this alternative to contain the TCE groundwater plume emanating from the Motor Pool Area (Figure 2-4). Treatment may be performed at the Irondale Boundary Control System or at a separate treatment system. This separate system may be implemented and operated either independently or in conjunction with the Rail Classification Yard IRA.

Installation of an in situ vapor extraction system and groundwater interception and treatment system will effectively mitigate future potential contamination migration from the Motor Pool Area. Therefore, implementation of this action now will yield both a cost and technical benefit since treatment after the TCE has spread becomes both more complex and costly insofar as a larger area must be addressed. The groundwater containment system proposed at this site will also help mitigate the potential effects on the TCE plume caused by any future groundwater use in the area. In addition, implementation of this action will be consistent with and contribute to the efficient performance of the final response action.

**5.0
CHRONOLOGY OF EVENTS**

The significant events leading to the proposed decision to remediate soils in the Motor Pool Area as described in Section 6.0 of this report are presented below.

<u>Date</u>	<u>Event</u>
June 1987	State of Colorado, Shell Oil Company, EPA, and the Army develop and agree in a June 1987 report to the court to a prospective hot spot list that identifies Interim Response Actions (IRAs) to be conducted. The hot spot list consists of five areas (the Section 36 Trenches, the Section 36 Lime Pits, the M-1 Settling Basins, the Motor Pool Area, and the Railroad Housing Track in the Rail Classification Yard) referred to as "Other Contamination Sources" in the proposed Consent Decree (Section 9.1, paragraph l), and in the Federal Facility Agreement, paragraph 22.1 (l).
January 31, 1989	The Army instructs Woodward-Clyde Consultants (WCC) to develop plans for interim action investigation work in response to the hot spot list. Interim action investigation work includes the Motor Pool Area.
April 13, 1989	A draft Task Plan, that includes the Motor Pool Area, is submitted by the Army to the Organizations and the State for comment.
April 17, 1989	Field investigations begin for the other contamination sources IRA. Work includes investigation of the contaminant source(s) within the Motor Pool Area.
June 29, 1989	A final Task Plan is issued by the Army with comments incorporated.
July 20, 1989	Field investigation completed.
September 7, 1989	Draft Final Alternatives Assessment of Interim Response Actions for Other Contamination Sources - Motor Pool Area and draft ARARs are distributed by the Army to the Organizations and the State for comment.

Woodward-Clyde Consultants

- November 27, 1989 Draft Final Results of Field and Laboratory Investigations Conducted for the Remediation of Other Contamination Sources Interim Response Action is distributed by the Army to the Organizations and the State.
- November 27, 1989 Final Alternatives Assessment of Interim Response Action for Other Contamination Sources - Motor Pool Area is distributed by the Army to the Organizations and the State with responses to comments incorporated.
- November 27, 1989 Proposed Decision Document for the Interim Response Action at the Motor Pool Area at the Rocky Mountain Arsenal is distributed by the Army to the Organizations and the State for comment.
- February 1, 1990 Draft Final Decision Document for the Interim Response Action at the Motor Pool Area at the Rocky Mountain Arsenal is distributed by the Army to the Organizations and the State.
- March 5, 1990 Decision Document for the Interim Response Action at the Motor Pool Area at the Rocky Mountain Arsenal is finalized.

Installing and operating an in situ vapor extraction system in conjunction with a groundwater interception and treatment system is the chosen alternative. This alternative can be easily implemented because it is based on demonstrated technology and has been widely used. The system can be easily adapted to a greater depth or extent of contamination, which is important because of the uncertainties in contaminated soil volume at this site. Also, since the carbon is thermally reactivated, the contaminants are destroyed.

This alternative will involve installing several extraction wells or trenches in the area of TCE contaminated soil at the Motor Pool Area. A pilot test will be performed before installation to estimate soil parameters and soil gas flow properties. This information will help determine the well locations or trench size necessary for the design of the vapor extraction system. Pressurized and possibly pre-heated air will be injected into the soil. Soil vapors will be drawn by a positive displacement vacuum blower through an inlet liquid separator/silencer, which is insulated to muffle expanding gas noise. Stack discharges will be monitored and regulated to maintain a volatile organics emission rate below standard emission limits. An automatic shut-off will be installed in the stack monitoring system to shut off the system if emissions reach a concentration above the standards.

Stack treatment may be necessary depending on pilot test and startup results. The blower exhaust air can be routed through a vapor phase carbon filter or catalytic oxidizer to adsorb or oxidize volatile emissions from the exhaust before discharge to the atmosphere.

Any liquid collected or condensed from the inlet/silencer would consist predominantly of condensed water vapor from the soil gas. This water would require treatment before disposal. If the CERCLA Wastewater Treatment System is available, this condensate would be sent there. If not, an applicable treatment would be onsite granular activated carbon adsorption. The spent carbon would require subsequent reactivation. In either case, the volume of water is expected to be very low.

In order to contain the TCE plume emanating from the Motor Pool Area, a groundwater interception and treatment system will be implemented either independently, or as part of the IRA for the Rail Classification Yard. The groundwater will be intercepted by extraction wells that will collect the contaminated groundwater and retard the progress of the plume. The extraction wells will be located north-northwest of the Motor Pool Area and will be designed to contain the TCE groundwater plume emanating from the Motor Pool Area. The exact location and extraction rate will be determined during the design phase.

Treatment of groundwater extracted in the vicinity of the Motor Pool Area will be accomplished by sending water through conveyance piping to the Irondale Boundary Control System, which may be expanded, if feasible, to

deal with the increased flow. If the Irondale Boundary Control System cannot be adapted to deal with the increased flow, either an independent treatment system will be built to handle the Motor Pool Area plume or a treatment system would be built in the vicinity of the Motor Pool Area IRA and Rail Classification Yard IRA extraction systems to treat the combined flow. Identification of an appropriate treatment facility will be conducted during the design phase.

A groundwater monitoring program will be implemented as part of this alternative to evaluate the continued effectiveness of this IRA.

6.1 HEALTH & SAFETY PLAN

A Health & Safety Plan has been developed for the prevention of occupational injuries and illnesses during field activities at RMA. This plan addresses health and safety requirements of contractors and their authorized subcontractors. Compliance with this plan will be compulsory, and the contractors will be responsible for self-enforcement and compliance with this plan. The Health & Safety Plan was developed taking into consideration known hazards as well as potential risks. Comprehensive environmental monitoring and site-specific personal protection are combined in an effort to best protect workers.

A site-specific Health & Safety Plan for work to be performed in the Motor Pool Area will be developed.

7.0

INTERIM RESPONSE ACTION PROCESS

With respect to the Interim Response Action (IRA) for the remediation of other contamination sources for the Motor Pool Area at Rocky Mountain Arsenal (RMA), the IRA process is as follows:

1. The scope of the IRA is described in the June 5, 1987 report to the Court of the United States (the Army and EPA), Shell, and the State in United States v. Shell Oil Co. A similar description is included in the proposed Consent Decree, paragraph 9.1 (l), and in the Federal Facility Agreement (FFA), paragraph 22.1 (l).
2. The Organization(s) and DOI shall have the opportunity to participate, at the RMA Committee level, in the identification and selection of Applicable or Relevant and Appropriate Requirements (ARARs) that may be applicable to IRAs.
3. The Army issues this proposed Decision Document for the IRA for the interim remediation of other contamination sources, Motor Pool Area, for a 30-day public comment period. During the 30-day comment period, the Army will hold one public meeting addressing the IRA decision. This proposed Decision Document is supported by an administrative record.
4. Promptly after the close of the comment period, the Army shall transmit to the other Organizations, Department of Interior (DOI), and the State, a draft final IRA Decision Document for the remediation of other contamination sources, Motor Pool Area.
5. Within 20 days after the issuance of a draft final IRA Decision Document for the interim remediation of other contamination sources, Motor Pool Area, an Organization (including the State if it has agreed to be bound by the Dispute Resolution process, as required by the FFA, or DOI under the provisions set forth in the FFA) may invoke Dispute Resolution.
6. After the close of the period for invoking Dispute Resolution, if Dispute Resolution is not invoked, or after the completion of Dispute Resolution, if invoked, the Army shall issue a final IRA Decision Document to the other Organizations, DOI, and the State. The Army shall also notify the public of the availability of the final IRA Decision Document with the supporting administrative record. Only preliminary design work for the IRA may be conducted prior to the issuance of the final IRA Decision Document.

7. The IRA Decision Document for the remediation activity of the Motor Pool Area will be subject to judicial review in accordance with Section XXXIX of the Federal Facility Agreement except where such review is barred by Sections 113 and 121 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. Sections 6913 and 9621.
8. Following issuance of the final IRA Decision Document, the Army shall be the lead party responsible for designing and implementing the IRA in conformance with the Decision Document. The Army shall issue a draft IRA Implementation Document to the DOI, the State, and the other Organizations for review and comment. The draft implementation document shall include final drawings and specifications, final design analysis, a cost estimate, and IRA deadlines for implementation of the IRA.
9. If any organization (including the State) or the DOI, believes that the IRA is being designed or implemented in a manner that will not meet the objectives for the IRA set forth in the final IRA Decision Document, or is otherwise not being properly implemented, it may so advise the others and shall recommend how the IRA should be properly designed or implemented. Any organization (including the State, if it has agreed to be bound by the process of Dispute Resolution, as required by the FFA, or the DOI under the circumstances defined in the FFA) may invoke Dispute Resolution to resolve the disagreement.
10. As Lead Party for the design and implementation of this IRA, the Army will issue the final implementation document, as described above, and will be responsible for implementing the IRA in accordance with the IRA Implementation Document.

8.0

**APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS
FOR THE REMEDIATION OF OTHER CONTAMINATION SOURCES - MOTOR POOL AREA
INTERIM RESPONSE ACTION**

8.1 INTRODUCTION

These Applicable or Relevant and Appropriate Requirements (ARARs) address the Rocky Mountain Arsenal (RMA) Motor Pool Area, which has been identified for remediation prior to the issuance of a Record of Decision (ROD) for the Onpost Operable Unit of the RMA. The selected alternative to accomplish this interim remediation is *in situ* vapor extraction. This action is not the final response action but an interim action to address this contamination source prior to the issuance of the Onpost ROD.

8.2 AMBIENT OR CHEMICAL-SPECIFIC ARARS

Ambient or chemical-specific requirements set concentration limits or ranges in various environmental media for specific hazardous substances, pollutants, or contaminants. Such ARARs either set protective cleanup levels for the chemicals of concern in the designated media or indicate an appropriate level of discharge based on technological considerations.

The objectives of this interim response action (IRA) are discussed in the Final Alternatives Assessment Document and this Final Decision Document. This IRA will be implemented prior to the final remediation to be undertaken in the context of the Onpost Operable Unit ROD. The primary contaminant of concern for this IRA is trichloroethylene (TCE), a volatile organic compound. The media of concern here are subsurface soils containing volatile organic contaminants, primarily TCE. However, no ambient or chemical-specific ARARs were identified concerning levels of contaminants for soils. This IRA is expected to take advantage of groundwater treatment provided through the IRA addressing the Rail Classification Yard and chemical-specific ARARs concerning water treated by that IRA, including water received from the plume related to the Motor Pool Area, are contained in that Final Decision Document. It is possible that a separate system for groundwater treatment will be constructed for this IRA. The Final Decision Document for the Rail Classification Yard IRA contains the detailed discussion of chemical-specific ARARs for groundwater treatment. The standards identified below will apply at the point of reinjection of treated groundwater from the groundwater treatment system implemented pursuant to this IRA:

<u>Compound</u>	<u>ARAR Level</u>	<u>Source</u>
Benzene	5 ug/l	40 CFR § 141.61(a)
1,1-dichloroethylene	7 ug/l	CBSG
1,2-dichloroethylene	70 ug/l	CBSG
T-1,2-dichloroethylene	7 ug/l	40 CFR § 141.61(a)

Toluene	2,420	ug/l	CBSG
1,1,1-trichloroethane	200	ug/l	40 CFR § 141.61(a)
1,1,2-trichloroethane	28	ug/l	CBSG
Trichloroethylene	5	ug/l	40 CFR § 141.61(a)

The following standards are TBCs and will be considered in the design of this treatment system and sought to be attained, if practicable:

<u>Compound</u>	<u>TBC Level</u>	<u>Source</u>
DBCP	0.2 ug/l	54 FR 22093
1,1-dichloroethylene	0.06 ug/l	EPA Health Assessment Summary
Toluene	2,000 ug/l	54 FR 22093
1,1,2-trichloroethane	0.6 ug/l	EPA Health Assessment Summary

8.2.1 Air Emissions

The standards contained in 40 CFR Part 50 were reviewed and determined to be neither applicable nor relevant and appropriate to this IRA. These standards apply to Air Quality Control Regions, which are large air masses normally encompassing many square miles and are markedly dissimilar from the area that may be affected by the operation of a positive displacement vacuum blower to be used for treatment by this IRA system. The specific compounds addressed by these standards: sulfur oxides, carbon monoxide, ozone, nitrogen oxide, and lead are not anticipated to be contained in any potential air emissions, and these standards are defined in terms of measurements in large air masses and not normally applied directly to specific emission sources so are not considered relevant and appropriate to apply to the type of emission source that is intended to be used in the context of this IRA.

The standards contained in 40 CFR Parts 60 and 61 were reviewed and determined not to be applicable to operations conducted as part of the treatment by this IRA system. These standards apply to specific sources of the listed pollutants. For example, Subpart E of 40 CFR Part 61 applies to sources that process mercury ore to recover mercury and other specific processes, and the arsenic provisions of Subparts N, O, and P of this part apply to very specific plants, smelters, or facilities. Since the operations contemplated by this IRA treatment system are extremely dissimilar from the processes described in 40 CFR Part 61, these standards were also not considered to be relevant and appropriate to apply to this IRA treatment system. However, as discussed in subsection 8.4 concerning action-specific ARARs, the Army will apply best practicable control technology to air emissions from treatment processes.

No specific air emission standard could be identified that addresses TCE. A records search indicated that U.S. Environmental Protection Agency (EPA) included vapor extraction as part of the remedy for the Seymour Recycling site in Indiana, and informal contact with the U.S. Army Corps of Engineers, Omaha District revealed that this remedy is also included in a recently issued ROD for a site in Arizona. The approach used by EPA

in this ROD was reported to be developing the specific emissions standards as part of the design and implementation, when more data were available. Considering the very low total amount of expected TCE emissions from the Motor Pool system, due to the low levels of TCE (parts per billion levels), the Army has determined that it is appropriate to establish a specific emissions standard for TCE from this treatment system in the design and implementation phase of this IRA, in coordination with EPA, Shell, and Colorado Department of Health (CDH).

8.3 LOCATION-SPECIFIC ARARS

Location-specific requirements set restrictions on activities, depending on the characteristics of the site or the immediate environment, and function like action-specific requirements. Alternative remedial actions may be restricted or precluded, depending on the location or characteristic of the site and the requirements that apply to it.

Paragraph 44.2 of the Federal Facility Agreement provides that "wildlife habitat(s) shall be preserved and managed as necessary to protect endangered species of wildlife to the extent required by the Endangered Species Act (16 U.S.C. 1531 *et seq.*), migratory birds to the extent required by the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), and bald eagles to the extent required by the Bald Eagle Protection Act, 16 U.S.C. 688 *et seq.*"

While this provision is not an ARAR, the statutory requirements recited are considered ARARs and obviously must be complied with for purposes of this IRA. Based on where any treatment system is likely to be located, the Army believes that this IRA will have no adverse impact on any endangered species or migratory birds or on the protection of wildlife habitats. Coordination will be maintained with the U.S. Fish and Wildlife Service to ensure that no such adverse impact arises from implementation of this IRA.

The Army considers the provisions of 40 CFR § 6.302(a) and (b), concerning the location of any treatment system and avoiding the construction of such system in a manner that would have an adverse impact on wetlands or be within a flood plain, relevant and appropriate to apply to the construction activities concerning this IRA.

The regulations in 40 CFR 230 were reviewed and determined not to be applicable within the context of this IRA because no discharge of dredged or fill material into waters of the United States is contemplated. Because these regulations address only the disposal of such materials into the waters of the United States, which is not contemplated, they are not considered to be relevant and appropriate to apply in the context of this IRA.

The regulations in 33 CFR 320-330 were reviewed and determined to be neither applicable nor relevant and appropriate because they address actions affecting the waters of the United States. No such actions are contemplated within the context of this IRA.

8.4 ACTION-SPECIFIC ARARS

8.4.1 Description

Performance, design, or other action-specific requirements set controls or restrictions on activities related to the management of hazardous substances, pollutants, or contaminants. These action-specific requirements may specify particular performance levels, actions, or technologies as well as specific levels (or a methodology for setting specific levels) for discharged or residual chemicals.

8.4.2 Construction of Treatment System

8.4.2.1 Air Emissions

On the remote possibility that there may be air emissions during the course of the construction of any treatment system, the Army has reviewed all potential ambient or chemical-specific air emission requirements. As a result of this review, the Army found that there are, at present, no National or State ambient air quality standards currently applicable or relevant and appropriate to any of the volatile or semivolatile chemicals in the groundwater found in the area in which construction is contemplated.

In the context of this IRA, there is only a very remote chance of any release of volatiles or semivolatiles and, even if such a release did occur, it would only be intermittent and of very brief duration (because the activity that produced the release would be stopped and modified appropriately if a significant air emission, based upon specific standards contained in the Health and Safety Plan, was detected by the contractor's air monitoring specialist). The Army has significant experience with the construction of recharge trenches, extraction and reinjection wells, which construction is similar to that necessary for the emplacement of an in situ vapor extraction system, and has not experienced any problems from air emissions during construction of such facilities. Subsurface facilities contemplated by this IRA are similar in nature to these, and emissions problems are not anticipated. The site-specific Health and Safety Plan will adequately address these concerns. This plan to be developed for use in the IRA will detail operational modifications to be implemented in the event monitoring detects specific levels of such emissions.

The National Emissions Standards for Hazardous Air Pollutants (NESHAPS) were evaluated to determine whether they were applicable or relevant and appropriate to apply in the context of construction of this IRA. These standards were not considered applicable because they apply to stationary sources of these pollutants, not to construction activity. These standards were not considered relevant and appropriate because they were developed for manufacturing processes, which are significantly dissimilar to the short-term construction activity contemplated by this IRA. However, the substantive provisions of 40 CFR Part 61, Subpart V concerning

National Emission Standard for Equipment Leaks (Fugitive Emission Sources), particularly those substantive provisions found in 40 CFR §§ 61.242-1 - 61.242-11 are considered relevant and appropriate to apply to this IRA.

The provisions of 40 CFR 50.6 will be considered relevant and appropriate. This standard is not applicable because it addresses Air Quality Control Regions, which are areas significantly larger than and different from the area of concern in this IRA. Pursuant to this regulation, there will be no particulate matter transported by air from the site that is in excess of 50 micrograms per cubic meter (annual geometric mean), and the standard of 150 micrograms per cubic meter as a maximum 24-hour concentration will not be exceeded more than once per year.

8.4.2.2 Worker Protection

The provisions of 29 CFR 1901.120 are applicable to workers at the site because these provisions specifically address hazardous substance response operations under CERCLA. It should be noted that these activities are presently governed by the interim rule found in 29 CFR 1910.120 but that by the time IRA activity commences at the site, the final rule found at 54 FR 9294 (March 6, 1989) will be operative. (The final rule becomes effective on March 6, 1990.)

8.4.2.3 General Construction Activities

The following performance, design, or other action-specific State ARARs have been preliminarily identified by the Army as relevant and appropriate to this portion of the IRA and more stringent than any applicable or relevant and appropriate federal standard, requirement, criterion, or limitation. These standards are not applicable because they specifically do not address a remedial action or circumstance under CERCLA:

Colorado Air Pollution Control Commission Regulation No. 1, 5 CCR 1001-3, Part III(D)(2)(b), Construction Activities:

- a. Applicability - Attainment and Nonattainment Areas
- b. General Requirement

Any owner or operator engaged in clearing or leveling of land or owner or operator of land that has been cleared of greater than one (1) acre in nonattainment areas for which fugitive particulate emissions will be emitted shall be required to use all available and practical methods which are technologically feasible and economically reasonable in order to minimize such emissions, in accordance with the requirements of Section III.D. of this regulation.

c. Applicable Emission Limitation Guideline

Both the 20 percent opacity and the no off-property transport emission limitation guidelines shall apply to construction activities; except that with respect to sources or activities associated with construction for which there are separate requirements set forth in this regulation, the emission limitation guidelines there specified as applicable to such sources and activities shall be evaluated for compliance with the requirements of Section III.D. of this regulation. (Cross Reference: Subsections e. and f. of Section III.D.2 of this regulation).

d. Control Measures and Operating Procedures

Control measures or operational procedures to be employed may include but are not necessarily limited to planting vegetation cover, providing synthetic cover, watering, chemical stabilization, furrows, compacting, minimizing disturbed area in the winter, wind breaks, and other methods or techniques.

Colorado Ambient Air Quality Standards, 5 CCR 1001-14, Air Quality Regulation A, Diesel-Powered Vehicle Emission Standards for Visible Pollutants:

- a. No person shall emit or cause to be emitted into the atmosphere from any diesel-powered vehicle any air contaminant, for a period greater than 10 consecutive seconds, which is of such a shade or density as to obscure an observer's vision to a degree in excess of 0 percent opacity, with the exception of Subpart B below.
- b. No person shall emit or cause to be emitted into the atmosphere from any naturally aspirated diesel-powered vehicle of over 8,500 lbs gross vehicle weight rating operated above 7,000 feet (mean sea level), any air contaminant for a period of 10 consecutive seconds, which is of a shade or density as to obscure an observer's vision to a degree in excess of 50 percent opacity.
- c. Diesel-powered vehicles exceeding these requirements shall be exempt for a period of 10 minutes, if the emissions are a direct result of a cold engine start-up and provided the vehicle is in a stationary position.
- d. This standard shall apply to motor vehicles intended, designed, and manufactured primarily for use in carrying passengers or cargo on roads, streets, and highways.

Woodward-Clyde Consultants

The following performance, design, or action-specific State ARAR is applicable to this portion of the IRA and is more stringent than any applicable or relevant and appropriate Federal standard, requirement, criterion, or limitation:

Colorado Noise Abatement Statute, C.R.S. Section 25-12-103:

- a. Each activity to which this article is applicable shall be conducted in a manner so that any noise produced is not objectionable due to intermittence, beat frequency, or shrillness. Sound levels of noise radiating from a property line at a distance of 25 feet or more there from in excess of the db(A) established for the following time periods and zones shall constitute *prima facie* evidence that such noise is a public nuisance:

<u>Zone</u>	<u>7:00 a.m. to next 7:00 p.m.</u>	<u>7:00 p.m. to next 7:00 a.m.</u>
Residential	55 db(A)	50 db(A)
Commercial	60 db(A)	55 db(A)
Light Industrial	70 db(A)	65 db(A)
Industrial	80 db(A)	75 db(A)

- b. In the hours between 7:00 a.m. and the next 7:00 p.m., the noise levels permitted in subsection (1) of this section may be increased by 10 db(A) for a period of not to exceed 15 minutes in any one-hour period.
- c. Periodic, impulsive, or shrill noises shall be considered a public nuisance when such noises are at a sound level of 5 db(A) less than those listed in Subpart (a) of this section.
- d. Construction projects shall be subject to the maximum permissible noise levels specified for industrial zones for the period within which construction is to be completed pursuant to any applicable construction permit issued by proper authority or, if no time limitation is imposed, for a reasonable period of time for completion of the project.
- e. For the purpose of this article, measurements with sound level meters shall be made when the wind velocity at the time and place of such measurement is not more than 5 miles per hour.

- f. In all sound level measurements, consideration shall be given to the effect of the ambient noise level created by the encompassing noise of the environment from all sources at the time and place of such sound level measurements.

In substantive fulfillment of Colorado Air Pollution Control Commission Regulation No. 1, this IRA will employ the specified methods for minimizing emission from fuel burning equipment and construction activities. In substantive fulfillment of Colorado's Diesel-Powered Vehicle Emission Standards, no diesel motor vehicles associated with the construction shall be operated in a manner that will produce emissions in excess of those specified in these standards.

The noise levels pertinent for construction activity provided in C.R.S. Section 25-12-103 will be attained in accordance with this applicable Colorado statute.

8.4.2.4 Operation of Treatment System

Since small amounts of air emissions are anticipated from the treatment system, the Army will treat the provisions of Colorado Air Pollution Control Regulation No.3, Section IV (D)(3)(a), as relevant and appropriate and will use best practical control technology. This regulation is not applicable because the IRA treatment system will not be a major stationary source, as defined by that regulation. As discussed in the chemical-specific ARARs section, above, specific emissions limitations for TCE from this treatment system will be developed in the design and implementation phase of this IRA, when more specific data are available and when further information based upon experience with such systems at other sites is also available for review.

8.4.2.5 Wetlands Implications

Through estimation of the general area where any system would be located, the Army does not believe that any wetlands could be adversely affected. However, until a final design is selected and a final siting decision made, it cannot be definitively determined that no impact on wetlands will occur. If the final site selection and/or design results in an impact on wetlands, the Army will review the regulatory provisions identified as ARARs above concerning wetlands impact and other appropriate guidance, and will proceed in a manner consistent with those provisions. Coordination will be maintained with the U.S. Fish and Wildlife Service concerning any potential impacts on wetlands.

8.4.2.6 Land Disposal Restrictions and Removal of Soil

There are no action-specific ARARs that pertain to the excavation of soil during the construction of this treatment system.

EPA is currently developing guidance concerning the Land Disposal Restrictions (LDR), particularly their applicability to CERCLA remedial actions. While guidance is limited, the Army has not, at this time, made a determination that any listed waste subject to LDR will be present in the influent treated or soil removed by this IRA. More listings are scheduled to be completed prior to the implementation of this IRA, and the Army will review these as they are released. If it is determined that a listed waste is present, the Army will act in a manner consistent with EPA guidance for the management of such within the context of CERCLA actions.

Although guidance concerning removal of soil from the area where any treatment system will be located is a TBC, not an ARAR, it will be performed in accordance with the procedures set forth in the Task No. 32 Technical Plan, Sampling Waste Handling (November 1987), and EPA's July 12, 1985, memorandum regarding "EPA Region VIII Procedure for Handling of Materials from Drilling, Trench Excavation and Decontamination during CERCLA RI/FS Operations at the Rocky Mountain Arsenal." Soils generated by excavation during the course of this IRA, either at surface or subsurface, may be returned to the location from which they originated (i.e., last out, first in). Any materials remaining after completion of backfilling that are suspected of being contaminated (based on field screening techniques identified in the referenced document) will be properly stored, sampled, analyzed, and ultimately disposed as CERCLA hazardous wastes, as appropriate.

For material determined to be hazardous waste resulting from construction activities, substantive RCRA provisions are applicable to their management. These substantive provisions include but are not limited to: 40 CFR Part 262 (Subpart C, Pre-Transport Requirements), 40 CFR Part 263 (Transporter Standards), and 40 CFR Part 264 (Subpart I, Container Storage and Subpart L, Waste Piles) and any more stringent substantive provisions of the corresponding State regulations contained in 6 CCR 1007-3. The specific substantive standards applied will be determined by the factual circumstances of the accumulation, storage, or disposal techniques actually applied to any such material.

8.4.2.7 Soil Treatment and Disposal

The proposed remedial action does not contemplate the on-site or off-site disposal of soils or contaminated material, other than resulting from construction activities, since vapor extraction from the soil is intended rather than excavation and disposal of soil.

8.5 COMPLIANCE WITH THE OTHER ENVIRONMENTAL LAWS

As is evident from the various portions of this document, this IRA was prepared in substantive compliance with 40 CFR 1502.16 (the regulations implementing the National Environmental Policy Act of 1969).

**9.0
SCHEDULE**

The Draft Implementation Document is scheduled for completion on November 1, 1990. The construction schedule will be contained in the Draft Implementation Document for this Interim Response Action (IRA). This milestone has been developed based upon the Final Assessment Document and the assumption that no dispute resolution will occur. If events that necessitate a schedule change or extension occur, the change will be incorporated in accordance with the Federal Facility Agreement.

10.0
CONSISTENCY WITH THE FINAL REMEDIAL ACTION

The Federal Facility Agreement states that all Interim Response Actions (IRA) shall "to the maximum extent practicable, be consistent with and contribute to the efficient performance of Final Response Actions" (paragraph 22.5).

The alternatives assessment criteria (WCC 1989) were used to evaluate the alternatives. The selected alternative, by providing significant interim remediation of a source of contamination, will be consistent with any Final Response Action.

Woodward-Clyde Consultants

11.0 REFERENCES

Ebasco Services, Inc. 1988. July. Final Contamination Assessment Report, Site 4-6, Motor Pool Area, Version 3.1, Task No. 38. RIC 88196R12.

Ebasco Services, Inc. 1989. May. Proposed Final Remedial Investigation Final Report, Vol. XII, Western Study Area, Version 3.2. RIC 89166R03.

Woodward-Clyde Consultants. 1989a. Final Alternative Assessment of Interim Response Actions for Other Contamination Sources, Motor Pool Area.

Woodward-Clyde Consultants. 1989b. Final Results of Field and Laboratory Investigations Conducted to Evaluate Interim Response Actions for Other Contamination Sources.

APPENDIX A
COMMENTS AND RESPONSES



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VI
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2408

DEC 27 1989

Ref: 8HWM-SR

Mr. Donald L. Campbell
Office of the Program Manager
Rocky Mountain Arsenal
ATTN: AMXRM-PM
Commerce City, Colorado 80022-2180

Re: Rocky Mountain Arsenal (RMA)
Proposed Decision Document for
the Interim Response Action at
the Motor Pool Area, November
1989.

Dear Mr. Campbell:

We have reviewed the above referenced report and have the enclosed comments. We are in agreement with the proposed selected remedy, an in-situ vapor extraction system working in combination with a groundwater intercept and treatment system.

However, we wish to emphasize the need for certain changes in the proposed Decision Document, including: 1) the establishment of a health-based air emissions level for TCE; 2) the selection of design flexibility to potentially add a destruction unit to the air emissions control system to allow attainment of that TCE air emission level; 3) the clarifications specified in the enclosure regarding selection of the groundwater system, its physical interrelationship with the Railyard Classification Area IRA and the Irondale Boundary Containment System, and the selection of ARARs for that part of the remedy; and 4) addressing the selection criteria for the alternatives. With such changes and adequate response to our comments, we expect a Draft Final Decision Document would be acceptable. Please contact Linda Jacobson at (303) 294-7093, if you have questions on this matter.

Sincerely,

Connally Mears

Connally Mears
EPA Coordinator for RMA Cleanup

Enclosure

cc: Col. Dan Voss, RMA-PMO
J. D. Smith, RMA-PMO
Jeff Edson, CDH
David Shelton, CDH
Vicky Peters, CAGO
Lt. Col. Scott Isaacson
Chris Hahn, Shell
R. D. Lundahl, Shell
Robert Foster, DOJ

RESPONSE TO EPA'S COMMENTS
ON THE PROPOSED DECISION DOCUMENT
FOR THE INTERIM RESPONSE ACTION
AT THE MOTOR POOL AREA VERSION 2.0
NOVEMBER 1989

GENERAL COMMENTS

One important note on this Decision Document: the document references the treatment system for the adjacent railyard as the possible treatment system for groundwater contaminants associated with the motor pool. The Railyard Classification Area IRA Decision Document did not discuss such. If the IRAs are going to be tied together, then the two documents should be consistent with one another and cite the Irondale Treatment System as that selected portion of the remedy, if that is the case (see our comments on the Railyard IRA).

Further, it should be clearly stated in the introduction, summary of the IRA, and conclusions sections of the text that groundwater remediation is selected as part of the remedy for this IRA, but that ARARs for that remedy are being established in the Railyard Decision Document.

Response: The Army has coordinated with Shell to clarify this point. Shell Oil Company is currently progressing on an effort to better define the plumes emanating from the rail yard and the Motor Pool Area and will evaluate the effectiveness of integrating the two containment systems. If this evaluation shows that the integration of the two containment systems and the use of the Irondale Boundary Control System Treatment Facility is an effective approach, then such an integration will be proposed.

Comment 1: The authors state that the groundwater interception and treatment system of the chosen alternative "... would be designed to extract approximately 100 to 150 GPM." The authors also state that the "... groundwater interception and treatment system would also be implemented ... to contain groundwater contamination from possible contamination sources not identified in time for this IRA." The shape of the TCE soil gas plume of Figure 2-3 does not suggest a large area of soil contamination by TCE but rather a relatively large area of TCE groundwater contamination emanating from a concentrated source with the TCE soil gas possibly emanating from the contaminated groundwater. This was concluded apparently in the 1987 EBASCO report.

The chosen alternative is appropriately groundwater containment, consisting of extraction, treatment and effluent injection, supported by vapor extraction. The design of the groundwater extraction and injection barrier system should be performed using modeling techniques such as those presented in the U.S. Army Corps of Engineers "Dewatering Manual" and should not be limited to a pumping rate of 100 to 150 gpm. The system would be designed to contain a groundwater plume represented approximately by the isoconcentrate line of 1 unit (units not defined) shown on Figure 2-3, which represents the source area. The economic configuration of wells would probably be a line of extraction wells down the centerline of the plume with a line of injection wells north of the indicated sources and transverse to the center line of the

Woodward-Clyde Consultants

plume. The possibility of connecting the injection well line to the proposed line of injection wells northwest of the rail classification yard should be considered.

Response: The pumping rate in the Decision Document was used for conceptual, cost-estimating purposes. The design would not be limited to this rate.

The EPA's interpretation of the soil gas results is feasible. The Army has proposed an IRA alternative to address the potential soil source of TCE contamination, as well as containment of the TCE groundwater plume near the Motor Pool Area.

The EPA's other suggestions will be considered during the design of this IRA. The limits of containment will be set during design.

Comment 2: Units of concentration from the soil gas survey should be applied to the concentration lines on Figure 2-3.

Response: The figure has been revised.

Comment 3: Multilayered Cap. The Alternatives Assessment Document for this IRA simply states that the cap would "... reduce infiltration of surface water." The Draft Decision Document states that the cap would "... greatly inhibit continued downward migration of contaminants to the groundwater through surface infiltration." Currently, the principal identified contaminant is TCE which is a high density material. The soil gas survey combined with knowledge of TCE density indicates that vertical infiltration is substantially complete and horizontal transport is in progress. The capability of the multilayer cap to inhibit further contaminant migration from the source area is suspect.

Response: The text of the Decision Document has been changed to be consistent with the IRA Alternatives Assessment Document. The Army agrees that the evidence indicates that there is a possibility that vertical infiltration of the TCE is substantially complete. The Army also agrees that there is a possibility that the utility of the multilayered cap may be somewhat limited.

Comment 4: Section 4.10, Conclusions, should be revised to indicate that 'a groundwater interception, treatment, and injection' system would also be implemented as part of this alternative to contain 'TCE and other' groundwater contamination sources not identified in time for this IRA."

Response: The text has been changed.

Comment 5: Section 4.10, Conclusions, should also indicate that the injection barrier may be effectively tied to the injection barrier of the proposed Rail Classification Yard IRA.

Response: Agreed, the text has been changed to discuss the potential tie between groundwater containment systems. An injection barrier has not been proposed at this point.

SPECIFIC COMMENTS

Comment 1: P. 3-1 Selection criteria. This page identifies 7 of 9 alternative assessment criteria that should be used to compare and contrast alternatives. The document, however, does not use the criteria for alternatives selection. Only reduction of toxicity, mobility, and volume is addressed in any detail. Evaluation of alternatives should be based upon, but not limited to, the criteria in Section 22.6 of the FFA.

Response: The Decision Document is intended to present a brief summary of the detailed alternative evaluation conducted in the IRA Alternatives Assessment. The text of the Decision Document has been revised to better discuss the overall protection of human health and the environment. The other criteria listed in Section 3.0 are discussed in this document. The Army assumes that the other two criteria the EPA is referring to are State (Support Agency) Approval and Community Acceptance. These criteria are addressed during the extensive review process for this document.

Comment 2: P. 4-2 In-Situ Vapor Extraction. This is a contaminant control and treatment alternative that could result in extraction of an unknown quantity of contaminants and at the same time be consistent with (or not preclude) any final remedy. It is a good alternative on that basis.

In-situ vapor extraction is a viable alternative for the removal of TCE from the vadose zone. The vadose zone may not be the existing source of groundwater contamination (See General Comments). If the major source of groundwater contamination is not from percolation of water through the vadose zone but rather a concentrated pocket of TCE at the base of the alluvium, then in-situ vapor extraction will not be an effective alternative for preventing further migration of TCE from the source area in the groundwater. Thus, combination with the groundwater treatment system is appropriate.

Response: Agreed.

Comment 3: P. 8-1 The Decision Document needs to establish a health-based standard for TCE air emissions. If the health-based standard cannot be otherwise achieved, flexibility should be specified in the Decision Document for the vapor extraction emission control system to be supplemented with a destruction unit during the design phase.

Response: The Final Decision Document addresses this matter.



Shell Oil Company

Recd
21 Dec 89
10:35
skp

One Shell Plaza
P.O. Box 4320
Houston, Texas 77210

December 20, 1989

Office of the Program Manager for Rocky Mountain Arsenal
ATTN: AMXRM-PM: Mr. Donald L. Campbell
Rocky Mountain Arsenal, Building 111
Commerce City, Colorado 80022-2180

Dear Mr. Campbell:

Enclosed herewith are Shell Oil's comments on the Proposed Decision Document for the Interim Response Action at the Motor Pool Area, November, 1989, Version 2.0. Shell's comments on ARAR's are being sent under separate cover.

Sincerely,

A handwritten signature in black ink, appearing to read "R. D. Lundahl".

R. D. Lundahl
Manager Technical
Denver Site Project

/ajg

Enclosure

cc: (w/enclosure)

Office of the Program Manager for Rocky Mountain Arsenal
ATTN: AMXRM-PM: Col. Daniel R. Voss
Bldg. E-4460
Aberdeen Proving Ground, MD 21010-5401

Office of the Program Manager for Rocky Mountain Arsenal
ATTN: AMXRM-RP: Mr. Kevin T. Blose
Rocky Mountain Arsenal, Building 111
Commerce City, CO 80022-2180

Office of the Program Manager for Rocky Mountain Arsenal
ATTN: AMXRM-JA: Mr. Bruce M. Huenefeld
Rocky Mountain Arsenal, Building 111
Commerce City, CO 80022-2180

cc: Mr. Bradley S. Bridgewater
Department of Justice
c/o Acumenics Research & Technology ..
999 18th Street
Suite 501, North Tower
Denver, CO 80202

Department of the Army
Environmental Litigation Branch
Pentagon Room JC480
ATTN: DAJA-ELL: Major Lawrence E. Rouse
Washington, DC 20310-2210

Victoria L. Peters, Esq.
Assistant Attorney General
CERCLA Litigation Section
1560 Broadway, Suite 250
Denver, CO 80202

Mr. Robert L. Duprey
Director, Hazardous Waste Management Division
U.S. Environmental Protection Agency, Region VIII
One Denver Place
999 18th Street, Suite 500
Denver, CO 80202-2405

Mr. Connally Mears, 8HWM-SR
EPA Coordinator for Rocky Mountain Arsenal
US EPA, Region VIII, Superfund
999 18th Street, Denver Place, Suite 500
Denver, CO 80202-2405

Mr. Thomas P. Looby
Assistant Director
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

Mr. Jeff Edson
Hazardous Materials and Waste Management Division
Colorado Department of Health
4210 East 11th Avenue
Denver, CO 80220

**RESPONSE TO SHELL OIL'S COMMENTS
ON THE PROPOSED DECISION DOCUMENT
FOR THE INTERIM RESPONSE ACTION
AT THE MOTOR POOL AREA
VERSION 2.0, NOVEMBER 1989**

Comment 1: Page 2-1, first paragraph,

Put between 1947 and 1982 at the end of the last sentence. This time period relates to manufacturing, not lease.

Response: The text has been changed.

Comment 2: Page 2-4, last paragraph.

Shell Oil Company is a signatory of the Federal Facility Agreement.

"The Federal Facility Agreement specifies 13 Interim Response Actions (IRA's) determined to be necessary and appropriate."

However, for the Remediation of Other Contamination Sources IRA, the Federal Facility Agreement states that "This action consists of assessment and, as necessary, the selection and implementation of an IRA for the . . . Motor Pool Area . ." (Article 22.1(1); emphasis added).

Response: The Army interprets the FFA's definition of an IRA to be the process which consists of assessment and, as necessary, the selection and implementation of an interim action. Therefore, implementation of an interim action may or may not be necessary, as determined by the assessment for this site.

The Army conducted the IRA Assessment for the Motor Pool Area and has determined that the interim action alternative chosen for implementation is necessary and appropriate.

Comment 3: Page 4-1, 4.0 Interim Response Action Alternatives.

Although long-term effectiveness is less important for an interim response action than for a final response action, this criterion seems to receive major emphasis in these summaries, whereas short-term effectiveness (e.g., impact on workers and the community) is hardly mentioned.

Response: The text has been changed to provide a more balanced summary of the detailed evaluation presented in the IRA Alternatives Assessment for the Motor Pool Area (WCC 1989a).

Comment 4: Page 4-3, first paragraph.

The system by Irondale is better known as the Irondale Boundary Control System.

Response: The text has been changed.

Comment 5: Page 4-4, 4.8 Low-Temperature Thermal Desorption.

"The condensate would be sent to a solvent/water separator and onto carbon filters. The clean water would be used for dust control during excavation and the gases would be sent to an afterburner."

Is carbon adsorbers meant rather than carbon filters? What happens to the recovered "solvent"? (It would not make sense to adsorb a pure organic phase on carbon). Where are the organic contaminants destroyed? Why are contaminants condensed if the process has an afterburner? What are the "gases" in the second sentence, e.g., noncondensibles, flue gases, etc? The process description in this first paragraph is confusing.

Response: The text has been changed. After the condensate is sent to a solvent/water separator, the solvent phase would be recovered. The liquid phase would be sent through granular activated carbon prior to either reuse for dust control or disposal. Any noncondensibles would be routed through either a vapor phase carbon adsorber to remove any noncondensed organics or routed to an afterburner. The spent carbon (both liquid and vapor phase) would be sent offsite for thermal regeneration. If an afterburner would be used, all gases would be sent to this unit for thermal destruction. The afterburner would then exhaust to the atmosphere.

Comment 6: Page 5-1, 5.0 Chronology of Events.

Reference to the report issued on 1989 field and laboratory investigations should be included in this chronology.

The entry for February 1988 should be deleted, because it is outside the process prescribed by the FFA. See paragraph 22.7 of the FFA. If the entry is to be retained, a date should be provided for the request, so that the Organizations may verify that such a request was in fact made. The March 7, 1988 letter from David L. Anderson to Edward J. McGrath includes a summary of the status of various requests for ARAR identifications, but does not mention any request in connection with this IRA.

Response: Reference to the 1989 field and laboratory report has been included. The entry for February 1988 has been deleted.

Comment 7: Page 6-2, second sentence.

See comment 4.

Response: The text has been changed.

Comment 8: Page 7-1.

Paragraphs 2. and 3. should be eliminated, because they do not apply to the Motor Pool Area portion of the "Hot Spots" IRA.

Response: The text has been changed to delete these paragraphs.

Comment 9: Page 7-1, paragraph 4.

To conform to paragraph 22.7 of the FFA, replace "The Army, Shell, and the State are given the opportunity to identify, on a preliminary basis," with "The Organizations and DOI shall have the opportunity to participate, at the RMA Committee level, in the identification and selection of."

Response: The text has been changed to comply with this wording.

Comment 10: Page 8-1, third paragraph.

In the fourth sentence, the media of concern is subsurface soils, not volatile organic contaminants.

Response: Agreed. The text has been changed.

**RESPONSES TO COMMENTS FROM SHELL OIL COMPANY
ON THE APPLICABLE OR RELEVANT AND APPROPRIATE
REQUIREMENTS FOR THE REMEDIATION OF OTHER
CONTAMINATION SOURCES (MOTOR POOL AREA)
INTERIM RESPONSE ACTION**

- Comment 1: Shell questions the selection of Subpart V (NESHAPs for equipment leaks) as an ARAR. Subpart V applies to certain sources that are intended to operate in volatile hazardous air pollutant (VHAP) service. 40 C.F.R. § 61.240(a). "In VHAP service" means that a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight a volatile hazardous air pollutant (VHAP) as determined by certain testing. The short-term construction activity should not result in such a fluid.
- Response: The Army has taken a conservative approach in identifying Subpart V as an ARAR at this stage in the IRA process. If later test data reflect that it would be unreasonable to apply Subpart V as an ARAR to the specific equipment involved in the IRA treatment process, the Army will consider this determination.
- Comment 2: Shell has the same comments regarding Regulation 3, Section IV(D)(3)(a), the land disposal restrictions, and RCRA provisions as it had for the M-1 settling basins.
- Response: The Army appreciates Shell's provision of the comments they provided to EPA concerning the applicability of land disposal restrictions to CERCLA response actions. As Shell is aware, guidance in this area is under development. The Army will act consistently with the guidance issued by EPA concerning this issue. The Army's approach concerning Regulation 3, cited above, is also conservative, but the Army believes it appropriate to apply practical control technology to the emissions system to be included in this IRA.

STATE OF COLORADO

COLORADO DEPARTMENT OF HEALTH

4210 East 11th Avenue
Denver, Colorado 80220
Phone (303) 320-8333



Kay Konner
Governor

Thomas M. Vernon, M.D.
Executive Director

December 27, 1989

Mr. Donald L. Campbell
Deputy Program Manager
Rocky Mountain Arsenal
AMXRM-PM, Bldg. 111
Commerce City, Colorado 80022-2180

Re: State Comments on Proposed Decision Documents for Other Contamination Sources - Motor Pool Area and Rail Classification Yard

Dear Mr. Campbell:

Enclosed are the State's comments on the above-referenced documents. Although we believe the purpose of the Interim Response Actions should be to remediate the sources of contamination whenever possible, we generally support the interim actions being proposed for the Motor Pool Area and the Rail Classification Yard. However, efforts to identify and characterize the sources of contamination must continue, and further response actions should be considered based on this additional characterization work.

Some of the comments being provided at this time may be more relevant to the design and implementation stage of the IRAs. The State feels that by submitting these comments at this time, the Army may be better able to utilize them.

If you have questions or wish to discuss these issues, please feel free to call me.

Sincerely,

Jeff Edson
RMA Project Manager
Hazardous Materials and
Waste Management Division

JE:jmb
C:\WS2000\RMA\CAMPBEL4.LTR

Enclosures

Mr. Campbell
Rocky Mountain Arsenal
December 27, 1989
Page 2

cc: Chris Hahn, Shell Oil Company
Michael R. Hope, Attorney General's Office, Colorado
John Moscato, Esq., U.S. Department of Justice
Connally Mears, EPA Region VIII
Edward J. McGrath, Esq., Holme Roberts & Owen
Bruce Ray, EPA
Major Lawrence E. Rouse, Judge Advocate General's Office
Tony Truschel, GeoTrans, Inc.

Woodward-Clyde Consultants

**RESPONSE TO STATE OF COLORADO'S COMMENTS
ON PROPOSED DECISION DOCUMENT
FOR OTHER CONTAMINATION SOURCES IRA
MOTOR POOL AREA**

COMMENTS

- Comments 1: The results of investigations to date do not provide a clear understanding of source(s) of ground water contamination. For this reason the Army has selected an interim action that is less dependent on source definition. We strongly recommend that additional source identification and characterization be undertaken; study and that as source characterization is completed, that more source-specific response actions be considered.
- Response: Any additional site characterization necessary to perform the final remediation will be conducted as part of the Feasibility Study. The Army believes that adequate data are available to perform an alternatives assessment and select an effective, timely interim response action according to the process outlined in the FFA.
- Comment 2: As stated in the State's comments on the Railyard IRA Proposed Decision Document, the ground water intercept system(s) for the Rail Classification yard and for the Motor Pool area should be evaluated and designed in concert.
- Response: This may be the case. Shell Oil Company is currently progressing on an effort to better define the plumes emanating from the Rail Classification Yard and Motor Pool Area and will evaluate the effectiveness of integrating the two containment systems. If this evaluation shows that the integration of the two containment systems and the use of the Irondale Boundary Control System Treatment Facility is an effective approach, then such an integration will be proposed.
- Comment 3: The decision to treat the motor pool contamination using the Irondale Containment System is incomplete without documentation that the ICS can treat the volatile organic compounds (TCE and others). This demonstration must be made at decision document stage of the process.
- Response: Adequacy of the Irondale Boundary Control System will be determined during the design of this IRA. See response to the State's Comment No. 2. Alternative approaches to groundwater treatment are identified in the Final Decision Document.
- Comment 4: Similarly, some level of demonstration must be made at the Decision Document stage that the ICS can accept the extra volume of contaminated influent scheduled to be provided by the motor pool intercept system. Shell estimates that the ICS may be able to treat up to 300 additional gpm, but this capacity would be allocated to Railyard IRA intercept influent.
- Response: See response to the State's Comment Nos. 2 and 3. Alternative approaches are identified and a specific approach will be reflected in the Implementation Document.

Woodward-Clyde Consultants

Comment 5: The specific criteria for the selection of the size of the area to be remediated by vapor extraction has not been provided and therefore must be specified in the design and implementation phase.

Response: Agreed.

Comment 6: The Decision Document should set forth a monitoring program to monitor the effectiveness of the IRA, including the vapor extraction system as well as ground water interception system. (This should include provisions for any monitoring wells). For the vapor extraction system, the system should be operated until the soil gas concentrations measured level off and remain steady for a period of at least 72 hours.

Response: A groundwater monitoring program will be implemented as part of this IRA. The text has been revised to clarify this. The State's recommendation on the vapor extraction system operation will be considered during design.

Comment 7: In Figure 2-3, the soil gas concentration contours do have units. If the units are ug/l gas, then there appears to be an approximate order of magnitude discrepancy between values reported in this study and the Ebasco investigation (see Figures 2-17, results of field and laboratory investigations conducted for the remediation of other contamination sources).

Response: Soil gas is a fairly qualitative method of identifying possible sources of contamination. Both investigations indicate a contamination source in the same vicinity. However, soil contamination concentrations cannot be quantitatively inferred from soil gas results.

**RESPONSES TO STATE COMMENTS ON DRAFT APPLICABLE OR
RELEVANT AND APPROPRIATE REQUIREMENTS FOR THE
MOTOR POOL INTERIM RESPONSE ACTION**

GENERAL COMMENTS

- Comment 1: The Army states the Motor Pool IRA will use the groundwater treatment system addressed in the Rail Classification Yard IRA and refers to the chemical-specific ARARs concerning water treated by that IRA. However, the Rail Classification Yard ARARs analysis does not list standards for many of the contaminants found in the groundwater in the Motor Pool area. Therefore, the Army or Shell should expand its ARARs analysis to include ARARs and "to be considered's" (TBC's) for contaminants detected in the Motor Pool area.
- Response: The chemical-specific ARARs for the Rail Classification Yard IRA include contaminants expected to be contained in the influent received from the Motor Pool area. See also the responses to comments from the State of Colorado concerning the Rail Classification Yard IRA.
- Comment 2: To the extent that this document repeats text contained in previous Army draft ARARs documents without acknowledging prior comments offered by the parties, the State refers the Army to previous State ARARs comments on those documents. See in particular comments regarding the CERCLA Wastewater IRA and the off-post Draft Endangerment Assessment/Feasibility Study.
- Response: The State is referred to the Army's responses to comments received from the State on the identified documents.
- Comment 3: Any storage, treatment, or disposal of hazardous wastes from the Motor Pool, which is a CHWMA/RCRA regulated unit, must comply with all procedural as well as substantive provisions of the Colorado Hazardous Waste Management Act.
- Response: The Army disagrees with this comment. As the State is aware, the Army is proceeding pursuant to CERCLA with this interim response action in the Motor Pool area. Consistent with CERCLA guidance, the Army will comply with substantive State requirements that are more stringent than corresponding federal requirements.

SPECIFIC COMMENTS

- Comment 1: P. 8-1, para. 3: The Army states that the primary contaminant of concern in the IRA is trichlorethylene (TCE). The Army should expand the ARAR's analysis to include all contaminants that are also contained in the groundwater in the Motor Pool Area. See General Comment 1.

Woodward-Clyde Consultants

Response: The response action designed specifically for the Motor Pool Area focuses on the extraction of TCE from the soils. Groundwater treatment is intended to be provided by the IRA for the Rail Classification Yard, and groundwater treatment ARARs are contained in the Final Decision Document for that IRA. The specific standards themselves have also been listed in the Final Decision Document for the Motor Pool Area IRA.

Comment 2: P. 8-1, para. 4: The Army states that the Standards in 40 C.F.R. pt. 50 were not determined to be applicable, relevant or appropriate, since the region "is markedly dissimilar from the area . . . affected by the operation of the . . . vacuum blower." this is an inadequate rationale for not determining 40 C.F.R. pt. 50 relevant and appropriate. The NCP states, "[r]equirements may be relevant and appropriate if they would be 'applicable' but for jurisdictional restrictions associated with the requirement." 40 C.F.R. § 300.6. The ground water in the motor pool area contains both VOC's and lead, and therefore the standards in 40 C.F.R. pt. 50 dealing with those contaminants apply. In addition, Colorado regulations, 5 CCR 1001-7, regulation 7 (VOCs) and 5 CCR 1001-10, regulation 8 are more stringent than the federal requirements. Therefore the ARARs analysis should be expanded to include the state regulations.

Response: The Army does not believe that the standards established under 40 CFR Part 50 are either specifically applicable or relevant and appropriate to this IRA activity. As stated in the document, the area for which these standards were developed, Air Quality Control Regions (AQCR), are substantially dissimilar from the small area which can be affected by the operation of this treatment system. Specific standards developed for the ambient air of large areas such as an AQCR are neither relevant nor appropriate to apply as specific emissions limitations to a source such as that contemplated in this IRA. For example, the specific standard for carbon monoxide found in 40 CFR Part 50 is not generally applied by regulatory agencies to individual emissions from automobile tailpipes, but to the ambient air in an AQCR. These standards are not developed for specific emissions sources and are not appropriate to apply to such specific sources. The Final Decision Document reflects the Army's approach to anticipated TCE emissions from the vapor extraction system. No state standard was identified which specifically addressed TCE emissions from such systems. The State, along with EPA and Shell, is expected to participate in the design and implementation of this IRA treatment system and provide technical input based upon its experience and knowledge regarding this treatment to assist in developing the specific design and emission limitations.

Comment 3: P. 8-2, para. 2: The Army states that the standards found in 40 C.F.R. § 61 ("NESHAPS") were not considered applicable, relevant or appropriate. The Army should consider NESHAPS relevant and appropriate if the contaminants subject to NESHAPS are emitted in quantities contemplated by the regulation.

Response: NESHAPS are process-specific and since the standards contained in those regulations are developed specifically for processes which are so dissimilar to that intended for this IRA treatment system, they are neither relevant nor appropriate to apply in the context of this IRA.

Woodward-Clyde Consultants

Comment 4: P. 8-4, para. 3: The Army states that the provisions of 40 C.F.R. § 50.06 are considered relevant and appropriate. However, the Army must also consider Colorado Regulation 1, which applies to all total suspended particulates (TSP) and is therefore stricter than the federal standard. The Army has also misstated the federal standard. The correct federal standard is that the particulate matter must not exceed 50 micrograms per cubic meter, not 75, as the Army states. The federal standard also lists particulate emission for a 24 hour average at 150 micrograms per cubic meter.

Response: Fugitive particulate emissions requirements of Colorado Regulation were considered. The Army recognizes these requirements and will use available and practical technology to minimize such emissions. This section has been revised to reflect the current standard in 40 CFR Part 50.6. The document also includes the state's specific standard in Regulation 1 for construction activity.

Comment 5: P. 8-1, para. 3: In the Army's section on the operation of the treatment system, the Army lists only one standard to apply to air emissions from the treatment system. The Army should do a more thorough ARAR analysis regarding emissions from the treatment system and should include in its analysis EPA's guidance regarding air emissions from air strippers at Superfund groundwater sites (June 15, 1989) (OSWER Directive 9355.0-28). The EPA document recognizes the policy's applicability to other vented extraction techniques such as soil vapor extraction.

Response: The Army will treat the provisions of Colorado Air Pollution Control Regulation No. 3, Section IV(D)(3)(a) as relevant and appropriate and will use best practical control technology. The Army has reviewed information concerning current approaches taken at other Superfund sites utilizing similar systems and determined that the best approach to take is to develop specific standards during the design and implementation phase when more data and more experience at other sites is available for review.